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The Phase Behavior of Polystyrene-b-Poly(2-vinylpyridine) System in Thin Film Geometry YOONKEUN KIM, KYOSUNG KOO, KYUNGINN KIM, HYUNGJU AHN, DU YEOL RYU, Department of Chemical & Biomolecular Engineering, Yonsei University, POLYMER THIN FILM LABORATORY TEAM — The thickness-dependent phase transitions of polystyrene-block-poly(2-vinylpyridine) (PS-*b*-P2VP) in the films was studied and compared with the melt using small-angle X-ray scattering (SAXS) and grazing incidence small-angle X-ray scattering (GISAXS). The PS-*b*-P2VP melt presented the sequential OOT transitions, composed of hexagonally perforated layer (HPL)-gyroid (GYR)-disordered phase (DIS) with increasing temperature, while the PS-*b*-P2VP films showed a different morphological transition pathway by decreasing film thickness. It was attributed to the film thickness effect of interfacial interactions on the order-to-order transition (OOT) and order-to-disorder transition (ODT) particularly in the 3-dimensional network structure of GYR.

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